From:	Michael Stephenson
To:	Jump, Christine
Cc:	SMITH, MARTIN L; JONES, Geoff
Subject:	CH Wichita confirmation sampling memo
Date:	Monday, February 10, 2014 5:03:18 PM
Attachments:	CH Wichita Confirmation Sampling Memo.pdf

Hello Chris,

Attached please find a draft memo describing our proposed approach for confirmation sampling following the heating remedy. We look forward to discussing this with you at your earliest convenience. Please don't hesitate to call with any questions.

Sincerely,

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M E M O R A N D U M

TO: CHRISTINE JUMP, USEPA

FROM: MIKE STEPHENSON

SUBJECT: SOIL CONFIRMATION SAMPLING FOLLOWING ERH TREATMENT, CLEAN HARBORS WICHITA

DATE: 2/10/2014

CC: MARTIN SMITH, GEOFF JONES - CLEAN HARBORS ENVIRONMENTAL SERVICES

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SOIL INTERIM MEASURE CONFIRMATION SAMPLING

Clean Harbors intends to undertake an interim remedial measure (IRM) at the Clean Harbors Wichita facility located at 2549 New York Avenue in Wichita KS (the Site). The remedial measure currently being pursued is electrical resistance heating (ERH) to treat vadose zone soils impacted with volatile organic compounds (VOCs). The distribution of these compounds at the Site has been thoroughly assessed through four phases of RFI investigation and supplemental work. Clean Harbors has determined that ERH is a very effective technology to treat this Site due to its relatively short projected cleanup time frame and ability to treat soils located under existing structures. The purpose of this memo is to present the proposed performance monitoring and final soil confirmation sampling approach that will be used to determine when interim action objectives (IAOs) have been achieved and the IRM can be considered complete. The IAOs being proposed for VOCs in soil at the Site are the KDHE Tier II soil to groundwater protection values under residential land use.

IRM Performance Monitoring

The IRM has been designed to reduce the concentrations of VOCs in soil at all locations across the Site to levels below IAOs. Figure 10 depicts the lateral extent of VOCs in soil exceeding these values. To assess the progress of the IRM in reducing soil concentrations of VOCs, performance monitoring soil samples will be collected during IRM operation. The results of these performance monitoring samples will be used as the basis for making operational changes to the ERH system including modifying energy input and ceasing active heating in areas demonstrated to have achieved IAOs. Shutting down a portion of the system allows energy to be applied in a smaller region(s) and may allow faster progress on the remaining region(s) which

saves both energy and money. This approach has been used at numerous ERH sites under EPA oversight and has met with agency approval.

Prior to collection of performance monitoring soil samples, system operating parameters including energy input, soil temperature and VOC concentrations in extracted soil vapor will be reviewed to determine if collection of soil samples is warranted. The first round of performance sampling will likely be scheduled near the time when 50-70% of the planned ERH energy has been input to the subsurface. Typically when remediating vadose zone soils, the first soil sampling event occurs when average subsurface temperatures within a treatment volume are above 50 degrees Celsius, which will likely occur after peak concentrations have been observed at the VGAC inlet.

Figure 10 presents a layout of the electrode field for all treatment areas on the Site. Also depicted on this figure are the locations of all temperature monitoring points (TMPs). Performance monitoring soil samples will be collected in close proximity to each of the 33 TMPs depicted on Figure 10. Due to the extensive above ground cabling and piping that will be present during active heating, access within the treatment area will be limited to those areas in close proximity to the TMPs. However, TMP locations have been selected to be in close proximity to those difficult areas with the highest VOC concentrations in soil which are expected to require the greatest energy input to achieve IAOs.

If the results of a performance monitoring sample are found to be above interim action objectives, ERH system operations will resume until operational parameters indicate that the area has been remediated. The subsequent performance monitoring sampling location shall be as close in proximity to the initial sampling location and at the same depth. Due to the fast nature of ERH, the second soil sample event may occur as early as a week to ten days after the first sample event. If the results from the second round of samples are found to be below interim action objectives, the IRM for the area will be deemed complete and the electrodes within the grid will be turned off and the energy redirected to areas where concentrations remain above interim action objectives.

Final Confirmation Sampling

Once performance monitoring results indicate that IAOs have been achieved at each of the 33 TMPs, final confirmatory sampling will commence. To allow sufficient access for performing final confirmatory sampling, some above ground portions of the ERH system will be dismantled. Figure 10 depicts a sampling grid superimposed over the ERH treatment areas. The square footage of each sampling grid is also presented on Figure 10 and these areas range in size from approximately 800 to 2,700 square feet. One confirmation soil boring will be installed within each sampling grid (total of 40 samples). An additional four soil samples will be collected from locations within the treatment area as directed by EPA. Soil samples for analysis of VOCs by 8260 will be collected

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from each boring at the depth where the highest concentrations of VOCs were detected in previous investigations.

The results from the confirmatory sampling event will be pooled and the distribution for each detected constituent will be tested using ProUCL. ProUCL is an EPA published statistical software package for use on environmental data sets with or without non-detect results. ProUCL will be used to compute 95% upper confidence limit (95% UCL) concentrations for each detected constituent using parametric or non-parametric frequency distributions and analysis methods as indicated as most appropriate by ProUCL. The site-wide calculated 95% UCL for each detected constituent will then be compared to the IAOs to determine if further heating is warranted. If the site wide 95% UCL for any constituent exceeds the IAO, heating will resume until additional confirmation sampling and statistical testing demonstrates that the 95% UCL has been reduced below the IAO.

To insure that isolated hot spots are addressed through the ERH remedy, any individual chemical-specific result that exceeds five times it's corresponding IAO will indicate the need to continue treating an area, regardless of the 95% UCL comparison. Areas with individual results exceeding five times the IAOs will continue to be heated until both the site-wide 95% UCL soil concentrations are below IAOs and no individual sampling results exceed five times the IAO.

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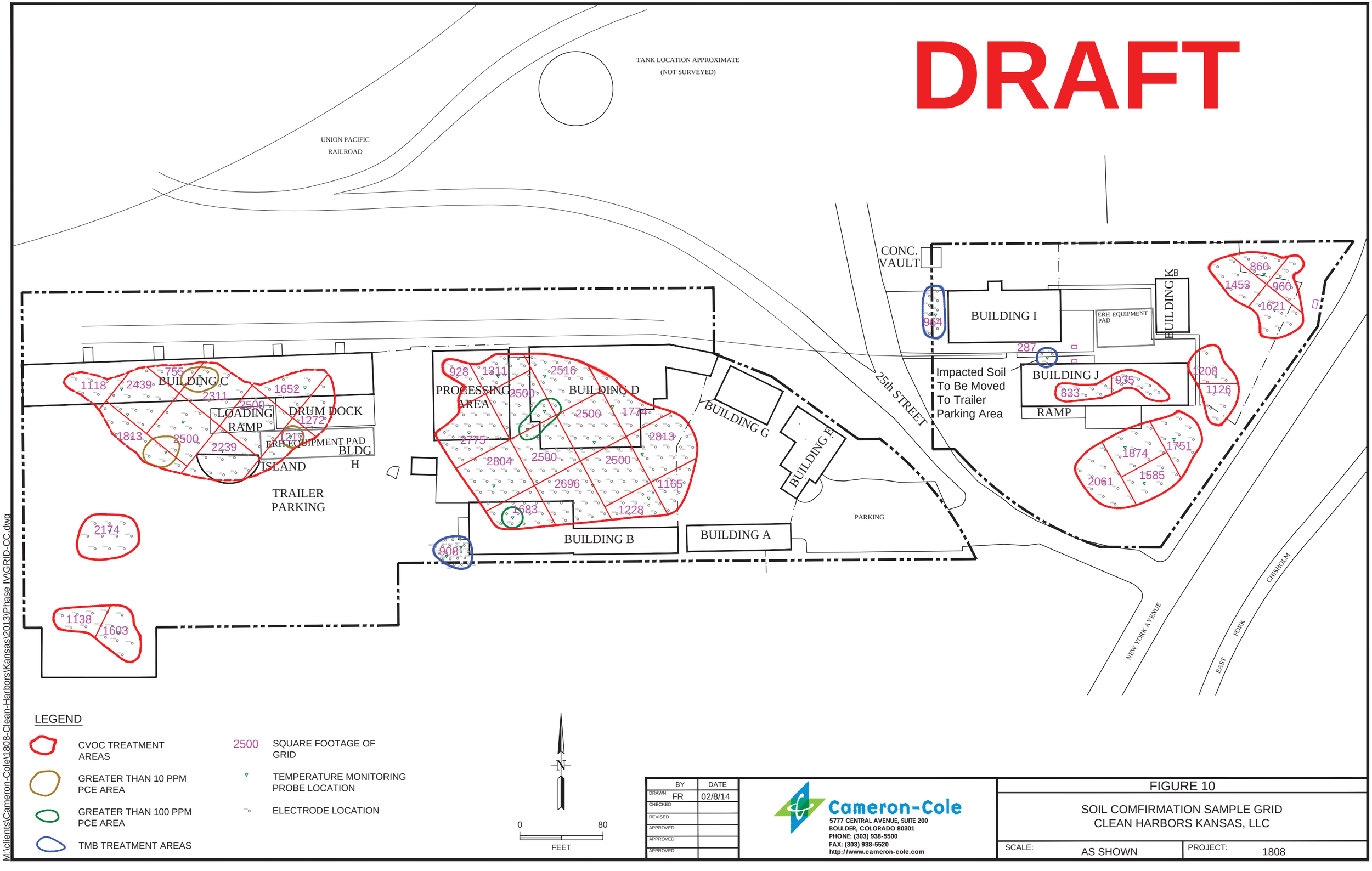

LEGEND

- CVOC TREATMENT AREAS
- GREATER THAN 10 PPM PCE AREA
- GREATER THAN 100 PPM PCE AREA
- TMB TREATMENT AREAS
- 2500 SQUARE FOOTAGE OF GRID
- TEMPERATURE MONITORING PROBE LOCATION
- ELECTRODE LOCATION

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FEET

	BY	DATE
DRAWN	FR	02/8/14
CHECKED		
REVISED		
APPROVED		
APPROVED		
APPROVED		

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FIGURE 10

SOIL COMFIRMATION SAMPLE GRID
CLEAN HARBORS KANSAS, LLC

SCALE: AS SHOWN

PROJECT: 1808

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